

Amendments to the Claims

Claim 1 (currently amended): A method of forming a transistor device, comprising:

~~providing a silicon-comprising surface;~~

~~exposing the silicon-comprising~~ a substrate surface having a first peak nitrogen concentration to activated nitrogen to form an exposed surface having a second peak nitrogen concentration ~~within the silicon-comprising surface of~~ at least 15% (atom percent), ~~the exposing forming a material comprising silicon and nitrogen~~ greater than the first peak nitrogen concentration;

~~providing a channel region on one side of the material comprising silicon and~~
~~nitrogen~~ exposed surface;

~~providing a transistor gate structure on a side of the material comprising silicon~~
~~and nitrogen~~ exposed surface that is opposed to said one side; and

~~forming a pair of source/drain regions separated from one another by the~~
~~channel region.~~

Claim 2 (currently amended): The method of claim 1 further comprising forming a layer of silicon dioxide over the channel region, and wherein the ~~silicon-comprising~~ substrate surface ~~is~~ comprises a surface of the silicon dioxide.

Claim 3 (original): The method of claim 1 wherein the transistor device is a PMOS device.

Claim 4 (original): The method of claim 1 wherein the transistor device is an NMOS device.

Claim 5 (currently amended): The method of claim 1 further comprising subjecting the ~~material comprising silicon and nitrogen~~ exposed surface to an anneal at a temperature of about 900°C for a time of from about 10 seconds to about 60 seconds; and wherein the ~~material comprising silicon and nitrogen~~ exposed surface is heated to the anneal temperature by rapid thermal processing at a temperature ramp rate of at least about 10°C/second.

Claims 6-25 (cancelled).

Claim 26 (currently amended): A method of forming a transistor device, comprising:

~~providing a silicon-comprising material;~~

defining a channel region of the transistor device beneath the ~~silicon-comprising material~~ a substrate surface;

implanting a dopant into the channel region to a concentration of less than about 7×10^{17} atoms/cm³ as a V_t implant;

forming a dielectric material over the channel region; ~~the~~ the forming of the dielectric material comprising exposing the ~~silicon-comprising material~~ substrate surface to activated nitrogen to ~~form~~ increase a peak nitrogen concentration within the ~~exposed silicon-comprising material of~~ substrate surface by at least about 15 atom percent, the dielectric material comprising the exposed ~~silicon-comprising material~~ surface;

forming a transistor gate structure over the ~~nitrogen-comprising~~ dielectric material; and

forming a pair of source/drain regions separated from one another by the channel region.

Claim 27 (currently amended): The method of claim 26 further comprising forming a layer of silicon dioxide over the channel region, and wherein the ~~silicon-comprising material is~~ substrate surface comprises the silicon dioxide.

Claim 28 (original): The method of claim 26 wherein the transistor device is a PMOS device.

Claim 29 (original): The method of claim 26 wherein the concentration of dopant in the V_t implant is less than 7×10^{17} atoms/cm³.

Claim 30 (original): The method of claim 26 wherein the concentration of dopant in the V_t implant is from about 1×10^{17} atoms/cm³ to 7×10^{17} atoms/cm³.

Claim 31 (original): The method of claim 26 wherein the concentration of dopant in the V_t implant is from about 1×10^{17} atoms/cm³ to 5×10^{17} atoms/cm³.

Claim 32 (original): The method of claim 26 wherein the activated nitrogen is formed from a plasma maintained at a power of from about 1,500 watts to about 5,000 watts.

Claim 33 (currently amended): The method of claim 26 wherein the activated nitrogen is formed from a plasma that is remote relative to the ~~silicon-comprising material~~ substrate surface.

Claim 34 (currently amended): The method of claim 26 wherein the activated nitrogen is formed from a plasma that contacts the ~~silicon-comprising material~~ substrate surface.

Claim 35 (currently amended): The method of claim 26 further comprising maintaining the ~~silicon comprising material~~ substrate surface at a temperature of from about 25°C to about 400°C during the exposing of the ~~material~~ substrate surface to the activated nitrogen.

Claims 36-60 (cancelled).

Claim 61 (previously presented): A method of forming a plurality of transistor devices comprising:

- providing a substrate having a surface, the surface comprising silicon;
- incorporating at least 15% (atom percent) nitrogen into the surface by exposing the surface to activated nitrogen;
- forming a pair of source/drain regions within the substrate, the pair of source/drain regions being separated from one another by a channel region, wherein each of the source/drain regions comprises a heavily doped portion proximate the channel region and a lightly doped portion separated from the channel region by the heavily doped portion; and
- providing a transistor gate structure over both the surface and the channel region.

Claim 62 (currently amended): The method of claim 61 wherein the surface consists essentially of silicon.

Claim 63 (previously presented): The method of claim 61 wherein the surface consists of silicon.

Claim 64 (previously presented): The method of claim 61 wherein the incorporating comprises forming the activated nitrogen by exposing a nitrogen precursor to a plasma.

Claim 65 (previously presented): The method of claim 61 wherein the surface has a thickness of less than 10 Å.

Claim 66 (previously presented): The method of claim 61 wherein the transistor device is a PMOS device.

Claim 67 (previously presented): The method of claim 61 wherein the transistor device is an NMOS device.